

SEQUENCE LISTING

<110> Shenoy, Sudha  
 Lefkowitz, Robert J.  
 <120> Modified Trafficking Patterns for Arrestin and G-Protein-Coupled  
 Receptors via Arrestin-Ubiquitin Chimera  
 <130> 186563/US/2 (469390-00352)  
 <140> US 10/543,122  
 <141> 2004-01-26  
 <150> US 60/442,403  
 <151> 2003-01-24  
 <160> 45  
 <170> PatentIn version 3.3  
 <210> 1  
 <211> 1581  
 <212> DNA  
 <213> Artificial  
 <220>  
 <223> Synthetic

<220>  
 <221> CDS  
 <222> (1)..(1575)

<400> 1 ctg ctg gag ttc gtg acc gcc gcc ggg atc act ctc ggc atg gac gag Leu Leu Glu Phe Val Thr Ala Ala Gly Ile Thr Leu Gly Met Asp Glu 1 5 10 15	48
ctg tac aag tcc gga ctc aga tct cga gct caa gct tcg aat tct gca Leu Tyr Lys Ser Gly Leu Arg Ser Arg Ala Gln Ala Ser Asn Ser Ala 20 25 30	96
gtc gac ggt acc acg cgc acc atg ggt gaa aaa ccc ggg acc agg gtc Val Asp Gly Thr Arg Thr Met Gly Glu Lys Pro Gly Thr Arg Val 35 40 45	144
ttc aag aag tcg agc cct aac tgc aag ctc acc gtg tac ttg ggc aag Phe Lys Lys Ser Ser Pro Asn Cys Lys Leu Thr Val Tyr Leu Gly Lys 50 55 60	192
cgt gac ttt gtg gat cac ttg gac aaa gtg gat cct gtc gat ggt gtg Arg Asp Phe Val Asp His Leu Asp Lys Val Asp Pro Val Asp Gly Val 65 70 75 80	240
gtg ctt gtg gat cct gac tac ttg aag gac cgg aaa gtg ttt gtg acc Val Leu Val Asp Pro Asp Tyr Leu Lys Asp Arg Lys Val Phe Val Thr 85 90 95	288
ctc acc tgt gcc ttc cgc tat ggc cga gaa gac ctg gat gta ctg ggc Leu Thr Cys Ala Phe Arg Tyr Gly Arg Glu Asp Leu Asp Val Leu Gly 100 105 110	336
ctg tct ttc cgc aaa gat ctg ttc atc gcc acc tac cag gcc ttc ccc Leu Ser Phe Arg Lys Asp Leu Phe Ile Ala Thr Tyr Gln Ala Phe Pro	384

115	120	125	
ccc atg ccc aac cca cct cg <sup>g</sup> ccc ccc acc cgc cta cag gac cga ctg Pro Met Pro Asn Pro Pro Arg Pro Pro Thr Arg Leu Gln Asp Arg Leu 130 135 140			432
ctg aag aag ttg ggc cag cat gcc cac ccc ttt ttt ttc aca ata ccc Leu Lys Lys Leu Gly Gln His Ala His Pro Phe Phe Phe Thr Ile Pro 145 150 155 160			480
cag aat ttg cct tgc tcc gtc aca ctg cag cca gga ccg gag gac aca Gln Asn Leu Pro Cys Ser Val Thr Leu Gln Pro Gly Pro Glu Asp Thr 165 170 175			528
ggg aag gcc tgt gga gta gac ttt gag att cga gcc ttc tgt gcc aaa Gly Lys Ala Cys Gly Val Asp Phe Glu Ile Arg Ala Phe Cys Ala Lys 180 185 190			576
tct ata gaa gaa aaa agc cac aaa agg aac tcc gtg ccg ctt atc atc Ser Ile Glu Glu Lys Ser His Lys Arg Asn Ser Val Arg Leu Ile Ile 195 200 205			624
aga aag gta cag ttt gct cct gag aca ccc ggc ccc cag cca tca gct Arg Lys Val Gln Phe Ala Pro Glu Thr Pro Gly Pro Gln Pro Ser Ala 210 215 220			672
gaa acc aca cgc cac ttc ctc atg tct gac ccg agg tcc ctg cac cta Glu Thr Thr Arg His Phe Leu Met Ser Asp Arg Arg Ser Leu His Leu 225 230 235 240			720
gag gct tcc ctg gac aaa gag ctg tac tac cat ggg gaa ccc ctc aat Glu Ala Ser Leu Asp Lys Glu Leu Tyr Tyr His Gly Glu Pro Leu Asn 245 250 255			768
gtc aac gtc cac gtc acc aac aat tct gcc aag acc gtc aag aag atc Val Asn Val His Val Thr Asn Asn Ser Ala Lys Thr Val Lys Lys Ile 260 265 270			816
aga gtg tct gtg aga cag tat gcc gac att tgc ctc ttc agc acc gcg Arg Val Ser Val Arg Gln Tyr Ala Asp Ile Cys Leu Phe Ser Thr Ala 275 280 285			864
cag tac aag tgt cct gtg gct cag ctt gaa caa gat gac cag gtg tct Gln Tyr Lys Cys Pro Val Ala Gln Leu Glu Gln Asp Asp Gln Val Ser 290 295 300			912
ccc agt tcc aca ttc tgc aag gtg tac acc ata acc ccg ctg ctc agt Pro Ser Ser Thr Phe Cys Lys Val Tyr Thr Ile Thr Pro Leu Leu Ser 305 310 315 320			960
gac aac cca gag aag cgt ggc ctt gcc ctt gat ggg caa ctc aag cac Asp Asn Pro Glu Lys Arg Gln Leu Ala Leu Asp Gly Gln Leu Lys His 325 330 335			1008
caa gac acc aac ctg gct tcc agc acc att gtg aag gag gga gcc aac Gln Asp Thr Asn Leu Ala Ser Ser Thr Ile Val Lys Glu Gly Ala Asn 340 345 350			1056
aag gag gtg ctg gga atc cta gta tcc tac agg gtc aac gtg aag ctg Lys Glu Val Leu Gly Ile Leu Val Ser Tyr Arg Val Asn Val Lys Leu 355 360 365			1104
gtg gtg tct cca ggc ggc gat gtc tcc gtg gag cta cct ttc gtc cta Val Val Ser Pro Gly Gly Asp Val Ser Val Glu Leu Pro Phe Val Leu			1152

370	375	380	
atg cac ccc aag ccc cac gac cac atc acc ctt ccc cga ccc cag tca			1200
Met His Pro Lys Pro His Asp His Ile Thr Leu Pro Arg Pro Gln Ser			
385 390 395 400			
gcc ccc cg <sup>g</sup> gaa ata gac atc cct gtg gat acc aac ctc att gaa ttc			1248
Ala Pro Arg Glu Ile Asp Ile Pro Val Asp Thr Asn Leu Ile Glu Phe			
405 410 415			
gat acc aac tat gcc aca gac gac atc gtg ttt gag gac ttt gc <sup>g</sup>			1296
Asp Thr Asn Tyr Ala Thr Asp Asp Asp Ile Val Phe Glu Asp Phe Ala			
420 425 430			
agg ctt cg <sup>g</sup> ctg aag ggg atg aag gat gac gac tgt gat gac cag ttc			1344
Arg Leu Arg Leu Lys Gly Met Lys Asp Asp Asp Cys Asp Asp Gln Phe			
435 440 445			
tgc gtc gac cag atc ttc gtg aag act ctg act ggt aag acc atc acc			1392
Cys Val Asp Gln Ile Phe Val Lys Thr Leu Thr Gly Lys Thr Ile Thr			
450 455 460			
ctc gag gtg gag ccc agt gac acc atc gag aat gtc aag gca aag atc			1440
Leu Glu Val Glu Pro Ser Asp Thr Ile Glu Asn Val Lys Ala Lys Ile			
465 470 475 480			
caa gat aag gaa ggc att cct cct gat cag cag agg ttg atc ttt gcc			1488
Gln Asp Lys Glu Gly Ile Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala			
485 490 495			
gga aaa cag ctg gaa gat ggt cgt acc ctg tct gac tac aac atc cag			1536
Gly Lys Gln Leu Glu Asp Gly Arg Thr Leu Ser Asp Tyr Asn Ile Gln			
500 505 510			
aaa gag tcc acc ttg cac ctg gta ctc cgt ctc aga ggt gggta			1581
Lys Glu Ser Thr Leu His Leu Val Leu Arg Leu Arg Gly			
515 520 525			

<210> 2  
 <211> 525  
 <212> PRT  
 <213> Artificial

<220>  
 <223> Synthetic Construct

<400> 2

Leu Leu Glu Phe Val Thr Ala Ala Gly Ile Thr Leu Gly Met Asp Glu  
 1 5 10 15

Leu Tyr Lys Ser Gly Leu Arg Ser Arg Ala Gln Ala Ser Asn Ser Ala  
 20 25 30

Val Asp Gly Thr Thr Arg Thr Met Gly Glu Lys Pro Gly Thr Arg Val  
 35 40 45

Phe Lys Lys Ser Ser Pro Asn Cys Lys Leu Thr Val Tyr Leu Gly Lys  
 50 55 60

Arg Asp Phe Val Asp His Leu Asp Lys Val Asp Pro Val Asp Gly Val  
65 70 75 80

Val Leu Val Asp Pro Asp Tyr Leu Lys Asp Arg Lys Val Phe Val Thr  
85 90 95

Leu Thr Cys Ala Phe Arg Tyr Gly Arg Glu Asp Leu Asp Val Leu Gly  
100 105 110

Leu Ser Phe Arg Lys Asp Leu Phe Ile Ala Thr Tyr Gln Ala Phe Pro  
115 120 125

Pro Met Pro Asn Pro Pro Arg Pro Pro Thr Arg Leu Gln Asp Arg Leu  
130 135 140

Leu Lys Lys Leu Gly Gln His Ala His Pro Phe Phe Phe Thr Ile Pro  
145 150 155 160

Gln Asn Leu Pro Cys Ser Val Thr Leu Gln Pro Gly Pro Glu Asp Thr  
165 170 175

Gly Lys Ala Cys Gly Val Asp Phe Glu Ile Arg Ala Phe Cys Ala Lys  
180 185 190

Ser Ile Glu Glu Lys Ser His Lys Arg Asn Ser Val Arg Leu Ile Ile  
195 200 205

Arg Lys Val Gln Phe Ala Pro Glu Thr Pro Gly Pro Gln Pro Ser Ala  
210 215 220

Glu Thr Thr Arg His Phe Leu Met Ser Asp Arg Arg Ser Leu His Leu  
225 230 235 240

Glu Ala Ser Leu Asp Lys Glu Leu Tyr Tyr His Gly Glu Pro Leu Asn  
245 250 255

Val Asn Val His Val Thr Asn Asn Ser Ala Lys Thr Val Lys Lys Ile  
260 265 270

Arg Val Ser Val Arg Gln Tyr Ala Asp Ile Cys Leu Phe Ser Thr Ala  
275 280 285

Gln Tyr Lys Cys Pro Val Ala Gln Leu Glu Gln Asp Asp Gln Val Ser  
290 295 300

Pro Ser Ser Thr Phe Cys Lys Val Tyr Thr Ile Thr Pro Leu Leu Ser  
305 310 315 320

Asp Asn Pro Glu Lys Arg Gly Leu Ala Leu Asp Gly Gln Leu Lys His  
325 330 335

Gln Asp Thr Asn Leu Ala Ser Ser Thr Ile Val Lys Glu Gly Ala Asn  
340 345 350

Lys Glu Val Leu Gly Ile Leu Val Ser Tyr Arg Val Asn Val Lys Leu  
355 360 365

Val Val Ser Pro Gly Gly Asp Val Ser Val Glu Leu Pro Phe Val Leu  
370 375 380

Met His Pro Lys Pro His Asp His Ile Thr Leu Pro Arg Pro Gln Ser  
385 390 395 400

Ala Pro Arg Glu Ile Asp Ile Pro Val Asp Thr Asn Leu Ile Glu Phe  
405 410 415

Asp Thr Asn Tyr Ala Thr Asp Asp Asp Ile Val Phe Glu Asp Phe Ala  
420 425 430

Arg Leu Arg Leu Lys Gly Met Lys Asp Asp Asp Cys Asp Asp Gln Phe  
435 440 445

Cys Val Asp Gln Ile Phe Val Lys Thr Leu Thr Gly Lys Thr Ile Thr  
450 455 460

Leu Glu Val Glu Pro Ser Asp Thr Ile Glu Asn Val Lys Ala Lys Ile  
465 470 475 480

Gln Asp Lys Glu Gly Ile Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala  
485 490 495

Gly Lys Gln Leu Glu Asp Gly Arg Thr Leu Ser Asp Tyr Asn Ile Gln  
500 505 510

Lys Glu Ser Thr Leu His Leu Val Leu Arg Leu Arg Gly  
515 520 525

<210> 3

<211> 1581

<212> DNA

<213> Artificial

<220>

<223> Synthetic

<220>

<221> CDS

<222> (1)..(1581)

<400> 3		
ctg ctg gag ttc gtg acc gcc gcc ggg atc act ctc ggc atg gac gag	48	
Leu Leu Glu Phe Val Thr Ala Ala Gly Ile Thr Leu Gly Met Asp Glu		
1 5 10 15		
ctg tac aag tcc gga ctc aga tct cga gct caa gct tcg aat tct gca	96	
Leu Tyr Lys Ser Gly Leu Arg Ser Arg Ala Gln Ala Ser Asn Ser Ala		
20 25 30		
gtc gac ggt acc acg cgc acc atg ggt gaa aaa ccc ggg acc agg gtc	144	
Val Asp Gly Thr Thr Arg Thr Met Gly Glu Lys Pro Gly Thr Arg Val		
35 40 45		
ttc aag aag tcg agc cct aac tgc aag ctc acc gtc tac ttg ggc aag	192	
Phe Lys Lys Ser Ser Pro Asn Cys Lys Leu Thr Val Tyr Leu Gly Lys		
50 55 60		
cgt gac ttt gtg gat cac ttg gac aaa gtc gat cct gtc gat ggt gtg	240	
Arg Asp Phe Val Asp His Leu Asp Lys Val Asp Pro Val Asp Gly Val		
65 70 75 80		
gtg ctt gtg gat cct gac tac ttg aag gac cgg aaa gtg ttt gtg acc	288	
Val Leu Val Asp Pro Asp Tyr Leu Lys Asp Arg Lys Val Phe Val Thr		
85 90 95		
ctc acc tgt gcc ttc cgc tat ggc cga gaa gac ctc gat gta ctg ggc	336	
Leu Thr Cys Ala Phe Arg Tyr Gly Arg Glu Asp Leu Asp Val Leu Gly		
100 105 110		
ctg tct ttc cgc aaa gat ctg ttc atc gcc acc tac cag gcc ttc ccc	384	
Leu Ser Phe Arg Lys Asp Leu Phe Ile Ala Thr Tyr Gln Ala Phe Pro		
115 120 125		
ccc atg ccc aac cca cct cgg ccc ccc acc cgc cta cag gac cga ctg	432	
Pro Met Pro Asn Pro Pro Arg Pro Pro Thr Arg Leu Gln Asp Arg Leu		
130 135 140		
ctg aag aag ttg ggc cag cat gcc cac ccc ttt ttt ttc aca ata ccc	480	
Leu Lys Lys Leu Gly Gln His Ala His Pro Phe Phe Phe Thr Ile Pro		
145 150 155 160		
cag aat ttg cct tgc tcc gtc aca ctg cag cca gca ccg gag gac aca	528	
Gln Asn Leu Pro Cys Ser Val Thr Leu Gln Pro Ala Pro Glu Asp Thr		
165 170 175		
ggg aag gcc tgt gga gta gac ttt gag att cga gcc ttc tgt gcc aaa	576	
Gly Lys Ala Cys Gly Val Asp Phe Glu Ile Arg Ala Phe Cys Ala Lys		
180 185 190		
tct ata gaa gaa aaa agc cac aaa agg aac tcc gtc cgg ctt atc atc	624	
Ser Ile Glu Glu Lys Ser His Lys Arg Asn Ser Val Arg Leu Ile Ile		
195 200 205		
aga aag gta cag ttt gct cct gag aca ccc ggc ccc cag cca tca gct	672	
Arg Lys Val Gln Phe Ala Pro Glu Thr Pro Gly Pro Gln Pro Ser Ala		
210 215 220		
gaa acc aca cgc cac ttc ctc atg tct gac cgg agg tcc ctg cac cta	720	
Glu Thr Thr Arg His Phe Leu Met Ser Asp Arg Arg Ser Leu His Leu		
225 230 235 240		
gag gct tcc ctg gac aaa gag ctg tac tac cat ggg gaa ccc ctc aat	768	

Glu Ala Ser Leu Asp Lys Glu Leu Tyr Tyr His Gly Glu Pro Leu Asn			
245	250	255	
gtc aac gtc cac gtc acc aac aat tct gcc aag acc gtc aag aag atc			816
Val Asn Val His Val Thr Asn Asn Ser Ala Lys Thr Val Lys Lys Ile			
260	265	270	
aga gtg tct gtg aga cag tat gcc gac att tgc ctc ttc agc acc gcg			864
Arg Val Ser Val Arg Gln Tyr Ala Asp Ile Cys Leu Phe Ser Thr Ala			
275	280	285	
cag tac aag tgt cct gtg gct cag ctt gaa caa gat gac cag gtg tct			912
Gln Tyr Lys Cys Pro Val Ala Gln Leu Glu Gln Asp Asp Gln Val Ser			
290	295	300	
ccc agt tcc aca ttc tgc aag gtg tac acc ata acc ccg ctg ctc agt			960
Pro Ser Ser Thr Phe Cys Lys Val Tyr Thr Ile Thr Pro Leu Leu Ser			
305	310	315	320
gac aac cga gag aag cgt ggc ctt gcc ctt gat ggg caa ctc aag cac			1008
Asp Asn Arg Glu Lys Arg Gly Leu Ala Leu Asp Gly Gln Leu Lys His			
325	330	335	
gaa gac acc aac ctg gct tcc agc acc att gtg aag gag gga ccc aac			1056
Glu Asp Thr Asn Leu Ala Ser Ser Thr Ile Val Lys Glu Gly Pro Asn			
340	345	350	
aac gag gtg ctg gga atc cta gta tcc tac agc gtc aag ctg aag ctg			1104
Asn Glu Val Leu Gly Ile Leu Val Ser Tyr Ser Val Lys Leu Lys Leu			
355	360	365	
gtg gtg tct cga cgc ggg gat gtc tcc gtg gag cta cct ttc ctc cta			1152
Val Val Ser Arg Arg Gly Asp Val Ser Val Glu Leu Pro Phe Leu Leu			
370	375	380	
atg cac ccc aag ccc cac cac atc acc ctt ccc cga ccc cag tca			1200
Met His Pro Lys Pro His His Ile Thr Leu Pro Arg Pro Gln Ser			
385	390	395	400
gcc ccc cgg gaa ata gac atc cct gtg gat acc aac ctc att gaa ttc			1248
Ala Pro Arg Glu Ile Asp Ile Pro Val Asp Thr Asn Leu Ile Glu Phe			
405	410	415	
gat acc aac tat gcc aca gac gac atc gtg ttt gag gac ttt gcg			1296
Asp Thr Asn Tyr Ala Thr Asp Asp Ile Val Phe Glu Asp Phe Ala			
420	425	430	
agg ctt cgg ctg aag ggg atg aag gat gac gac tct gat gac cag ttc			1344
Arg Leu Arg Leu Lys Gly Met Lys Asp Asp Asp Ser Asp Asp Gln Phe			
435	440	445	
tgc gtc gac cag att ttc gtc aag act ttg acc ggt aaa acc ata aca			1392
Cys Val Asp Gln Ile Phe Val Lys Thr Leu Thr Gly Lys Thr Ile Thr			
450	455	460	
ttg gaa gtt gaa tct tcc gat acc atc gac aac gtt aag tcg aaa att			1440
Leu Glu Val Glu Ser Ser Asp Thr Ile Asp Asn Val Lys Ser Lys Ile			
465	470	475	480
caa gac aag gaa ggt atc cct cca gat caa caa aga ttg atc ttt gcc			1488
Gln Asp Lys Glu Gly Ile Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala			
485	490	495	
ggt agg cag cta gaa gac ggt aga acg ctg tct gat tac aac att cag			1536

Gly Arg Gln Leu Glu Asp Gly Arg Thr Leu Ser Asp Tyr Asn Ile Gln		
500	505	510
aag gag tcc acc tta cat ctt gtg cta agg cta aga ggt ggt tga		1581
Lys Glu Ser Thr Leu His Leu Val Leu Arg Leu Arg Gly Gly		
515	520	525
<210> 4		
<211> 526		
<212> PRT		
<213> Artificial		
<220>		
<223> Synthetic Construct		
<400> 4		
Leu Leu Glu Phe Val Thr Ala Ala Gly Ile Thr Leu Gly Met Asp Glu		
1	5	10
Leu Tyr Lys Ser Gly Leu Arg Ser Arg Ala Gln Ala Ser Asn Ser Ala		
20	25	30
Val Asp Gly Thr Thr Arg Thr Met Gly Glu Lys Pro Gly Thr Arg Val		
35	40	45
Phe Lys Lys Ser Ser Pro Asn Cys Lys Leu Thr Val Tyr Leu Gly Lys		
50	55	60
Arg Asp Phe Val Asp His Leu Asp Lys Val Asp Pro Val Asp Gly Val		
65	70	75
Val Leu Val Asp Pro Asp Tyr Leu Lys Asp Arg Lys Val Phe Val Thr		
85	90	95
Leu Thr Cys Ala Phe Arg Tyr Gly Arg Glu Asp Leu Asp Val Leu Gly		
100	105	110
Leu Ser Phe Arg Lys Asp Leu Phe Ile Ala Thr Tyr Gln Ala Phe Pro		
115	120	125
Pro Met Pro Asn Pro Pro Arg Pro Pro Thr Arg Leu Gln Asp Arg Leu		
130	135	140
Leu Lys Lys Leu Gly Gln His Ala His Pro Phe Phe Phe Thr Ile Pro		
145	150	155
Gln Asn Leu Pro Cys Ser Val Thr Leu Gln Pro Ala Pro Glu Asp Thr		
165	170	175
Gly Lys Ala Cys Gly Val Asp Phe Glu Ile Arg Ala Phe Cys Ala Lys		
180	185	190

Ser Ile Glu Glu Lys Ser His Lys Arg Asn Ser Val Arg Leu Ile Ile  
195 200 205

Arg Lys Val Gln Phe Ala Pro Glu Thr Pro Gly Pro Gln Pro Ser Ala  
210 215 220

Glu Thr Thr Arg His Phe Leu Met Ser Asp Arg Arg Ser Leu His Leu  
225 230 235 240

Glu Ala Ser Leu Asp Lys Glu Leu Tyr Tyr His Gly Glu Pro Leu Asn  
245 250 255

Val Asn Val His Val Thr Asn Asn Ser Ala Lys Thr Val Lys Lys Ile  
260 265 270

Arg Val Ser Val Arg Gln Tyr Ala Asp Ile Cys Leu Phe Ser Thr Ala  
275 280 285

Gln Tyr Lys Cys Pro Val Ala Gln Leu Glu Gln Asp Asp Gln Val Ser  
290 295 300

Pro Ser Ser Thr Phe Cys Lys Val Tyr Thr Ile Thr Pro Leu Leu Ser  
305 310 315 320

Asp Asn Arg Glu Lys Arg Gly Leu Ala Leu Asp Gly Gln Leu Lys His  
325 330 335

Glu Asp Thr Asn Leu Ala Ser Ser Thr Ile Val Lys Glu Gly Pro Asn  
340 345 350

Asn Glu Val Leu Gly Ile Leu Val Ser Tyr Ser Val Lys Leu Lys Leu  
355 360 365

Val Val Ser Arg Arg Gly Asp Val Ser Val Glu Leu Pro Phe Leu Leu  
370 375 380

Met His Pro Lys Pro His His Ile Thr Leu Pro Arg Pro Gln Ser  
385 390 395 400

Ala Pro Arg Glu Ile Asp Ile Pro Val Asp Thr Asn Leu Ile Glu Phe  
405 410 415

Asp Thr Asn Tyr Ala Thr Asp Asp Asp Ile Val Phe Glu Asp Phe Ala  
420 425 430

Arg Leu Arg Leu Lys Gly Met Lys Asp Asp Asp Ser Asp Asp Gln Phe  
435 440 445

Cys Val Asp Gln Ile Phe Val Lys Thr Leu Thr Gly Lys Thr Ile Thr  
450 455 460

Leu Glu Val Glu Ser Ser Asp Thr Ile Asp Asn Val Lys Ser Lys Ile  
465 470 475 480

Gln Asp Lys Glu Gly Ile Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala  
485 490 495

Gly Arg Gln Leu Glu Asp Gly Arg Thr Leu Ser Asp Tyr Asn Ile Gln  
500 505 510

Lys Glu Ser Thr Leu His Leu Val Leu Arg Leu Arg Gly Gly  
515 520 525

<210> 5

<211> 1578

<212> DNA

<213> Artificial

<220>

<223> Synthetic

<220>

<221> CDS

<222> (1)..(1578)

<400> 5

ctg ctg gag ttc gtg acc gcc gcc ggg atc act ctc ggc atg gac gag 48  
Leu Leu Glu Phe Val Thr Ala Ala Gly Ile Thr Leu Gly Met Asp Glu  
1 5 10 15

ctg tac aag tcc gga ctc aga tct cga gct caa gct tcg aat tct gca 96  
Leu Tyr Lys Ser Gly Leu Arg Ser Arg Ala Gln Ala Ser Asn Ser Ala  
20 25 30

gtc gac ggt acc acg cgc acc atg ggt gaa aaa ccc ggg acc agg gtc 144  
Val Asp Gly Thr Thr Arg Thr Met Gly Glu Lys Pro Gly Thr Arg Val  
35 40 45

ttc aag aag tcg agc cct aac tgc aag ctc acc gtg tac ttg ggc aag 192  
Phe Lys Lys Ser Ser Pro Asn Cys Lys Leu Thr Val Tyr Leu Gly Lys  
50 55 60

cgt gac ttt gtg gat cac ttg gac aaa gtg gat cct gtc gat ggt gtg 240  
Arg Asp Phe Val Asp His Leu Asp Lys Val Asp Pro Val Asp Gly Val  
65 70 75 80

gtg ctt gtg gat cct gac tac ttg aag gac cgg aaa gtg ttt gtg acc 288  
Val Leu Val Asp Pro Asp Tyr Leu Lys Asp Arg Lys Val Phe Val Thr  
85 90 95

ctc acc tgt gcc ttc cgc tat ggc cga gaa gac ctg gat gta ctg ggc 336  
Leu Thr Cys Ala Phe Arg Tyr Gly Arg Glu Asp Leu Asp Val Leu Gly  
100 105 110

ctg tct ttc cgc aaa gat ctg ttc atc gcc acc tac cag gcc ttc ccc Leu Ser Phe Arg Lys Asp Leu Phe Ile Ala Thr Tyr Gln Ala Phe Pro 115 120 125	384
ccc atg ccc aac cca cct cgg ccc ccc acc cgc cta cag gac cga ctg Pro Met Pro Asn Pro Pro Arg Pro Pro Thr Arg Leu Gln Asp Arg Leu 130 135 140	432
ctg aag aag ttg ggc cag cat gcc cac ccc ttt ttt ttc aca ata ccc Leu Lys Lys Leu Gly Gln His Ala His Pro Phe Phe Phe Thr Ile Pro 145 150 155 160	480
cag aat ttg cct tgc tcc gtc aca ctg cag cca gga ccg gag cac aca Gln Asn Leu Pro Cys Ser Val Thr Leu Gln Pro Gly Pro Glu His Thr 165 170 175	528
gcc aag gcc tgt gga gta gac ttt gag att cga gcc ttc tgt gcc aaa Ala Lys Ala Cys Gly Val Asp Phe Glu Ile Arg Ala Phe Cys Ala Lys 180 185 190	576
tct ata gaa caa aaa agc cac aaa agg aac tcc gtg cgg ctt atc atc Ser Ile Glu Gln Lys Ser His Lys Arg Asn Ser Val Arg Leu Ile Ile 195 200 205	624
aga aag gta cag ttt gct cct gag aca ccc ggc ccc cag cca tca gct Arg Lys Val Gln Phe Ala Pro Glu Thr Pro Gly Pro Gln Pro Ser Ala 210 215 220	672
gaa acc aca cgc cac ttc ctc atg tct gac cgg agg tcc ctg cac cta Glu Thr Thr Arg His Phe Leu Met Ser Asp Arg Arg Ser Leu His Leu 225 230 235 240	720
gag gct tcc ctg gac aaa gag ctg tac tac cat ggg gaa ccc ctc aat Glu Ala Ser Leu Asp Lys Glu Leu Tyr Tyr His Gly Glu Pro Leu Asn 245 250 255	768
gtc aac gtc cac gtc acc aac aat tct gcc aag acc gtc aag aag atc Val Asn Val His Val Thr Asn Asn Ser Ala Lys Thr Val Lys Lys Ile 260 265 270	816
aga gtg tct gtg aga cag tat gcc gac att tgc ctc ttc agc acc gcg Arg Val Ser Val Arg Gln Tyr Ala Asp Ile Cys Leu Phe Ser Thr Ala 275 280 285	864
cag tac aag tgt cct gtg gct cag ctt gaa caa gat gac cag gtg tct Gln Tyr Lys Cys Pro Val Ala Gln Leu Glu Gln Asp Asp Gln Val Ser 290 295 300	912
ccc agt tcc aca ttc tgc aag gtg tac acc ata acc ccg ctg ctc act Pro Ser Ser Thr Phe Cys Lys Val Tyr Thr Ile Thr Pro Leu Leu Thr 305 310 315 320	960
gac aac cga gag aag cgt ggc ctt gcc ctt cat ggg caa ctc aac cac Asp Asn Arg Glu Lys Arg Gly Leu Ala Leu His Gly Gln Leu Asn His 325 330 335	1008
gaa cac acc aac ctg gct tcc agc acc att gtg aag gag gga gcc aac Glu His Thr Asn Leu Ala Ser Ser Thr Ile Val Lys Glu Gly Ala Asn 340 345 350	1056
gag gtc ctg gga atc cta gta tcc tac agg gtc aag gtg aag ctg gtg Glu Val Leu Gly Ile Leu Val Ser Tyr Arg Val Lys Val Lys Leu Val 355 360 365	1104

gtg tct cca ggc ggg gat ctc tcc gtg gag cta cct ttc gtc cta atg Val Ser Pro Gly Gly Asp Leu Ser Val Glu Leu Pro Phe Val Leu Met 370 375 380	1152
cac ccc aag ccc cac cac atc acc ctt ccc cca ccc cag tca gcc His Pro Lys Pro His His Ile Thr Leu Pro Pro Pro Gln Ser Ala 385 390 395 400	1200
ccc cgg gaa ata gac atc cct gtg gat acc aac ctc att gaa ttc gat Pro Arg Glu Ile Asp Ile Pro Val Asp Thr Asn Leu Ile Glu Phe Asp 405 410 415	1248
acc aac tat gcc aca gac gac gac atc gtg ttt gag gac ttt gcg agg Thr Asn Tyr Ala Thr Asp Asp Asp Ile Val Phe Glu Asp Phe Ala Arg 420 425 430	1296
ctt cgg ctg aag ggg atg aag gat gac gac tgt gat gac cag ttc tgc Leu Arg Leu Lys Gly Met Lys Asp Asp Asp Cys Asp Asp Gln Phe Cys 435 440 445	1344
gtc gac cag atc ttc gtg aag act ctg act ggt aag acc atc acc ctc Val Asp Gln Ile Phe Val Lys Thr Leu Thr Gly Lys Thr Ile Thr Leu 450 455 460	1392
gag gtg gag ccc agt gac acc atc gag aat gtc aag gca aag atc caa Glu Val Glu Pro Ser Asp Thr Ile Glu Asn Val Lys Ala Lys Ile Gln 465 470 475 480	1440
gat aag gaa ggc att cct cct gat cag cag agg ttg atc ttt gcc gga Asp Lys Glu Gly Ile Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala Gly 485 490 495	1488
aga cag ctg gaa gat ggt cgt acc ctg tct gac tac aac atc cag aaa Arg Gln Leu Glu Asp Gly Arg Thr Leu Ser Asp Tyr Asn Ile Gln Lys 500 505 510	1536
gag tcc acc ttg cac ctg gta ctc cgt ctc aga ggt ggg tga Glu Ser Thr Leu His Leu Val Leu Arg Leu Arg Gly Gly 515 520 525	1578

<210> 6  
<211> 525  
<212> PRT  
<213> Artificial

<220>  
<223> Synthetic Construct

<400> 6

Leu Leu Glu Phe Val Thr Ala Ala Gly Ile Thr Leu Gly Met Asp Glu  
1 5 10 15

Leu Tyr Lys Ser Gly Leu Arg Ser Arg Ala Gln Ala Ser Asn Ser Ala  
20 25 30

Val Asp Gly Thr Thr Arg Thr Met Gly Glu Lys Pro Gly Thr Arg Val  
35 40 45

Phe Lys Lys Ser Ser Pro Asn Cys Lys Leu Thr Val Tyr Leu Gly Lys  
Page 12

50

55

60

Arg Asp Phe Val Asp His Leu Asp Lys Val Asp Pro Val Asp Gly Val  
65 70 75 80

Val Leu Val Asp Pro Asp Tyr Leu Lys Asp Arg Lys Val Phe Val Thr  
85 90 95

Leu Thr Cys Ala Phe Arg Tyr Gly Arg Glu Asp Leu Asp Val Leu Gly  
100 105 110

Leu Ser Phe Arg Lys Asp Leu Phe Ile Ala Thr Tyr Gln Ala Phe Pro  
115 120 125

Pro Met Pro Asn Pro Pro Arg Pro Pro Thr Arg Leu Gln Asp Arg Leu  
130 135 140

Leu Lys Lys Leu Gly Gln His Ala His Pro Phe Phe Phe Thr Ile Pro  
145 150 155 160

Gln Asn Leu Pro Cys Ser Val Thr Leu Gln Pro Gly Pro Glu His Thr  
165 170 175

Ala Lys Ala Cys Gly Val Asp Phe Glu Ile Arg Ala Phe Cys Ala Lys  
180 185 190

Ser Ile Glu Gln Lys Ser His Lys Arg Asn Ser Val Arg Leu Ile Ile  
195 200 205

Arg Lys Val Gln Phe Ala Pro Glu Thr Pro Gly Pro Gln Pro Ser Ala  
210 215 220

Glu Thr Thr Arg His Phe Leu Met Ser Asp Arg Arg Ser Leu His Leu  
225 230 235 240

Glu Ala Ser Leu Asp Lys Glu Leu Tyr Tyr His Gly Glu Pro Leu Asn  
245 250 255

Val Asn Val His Val Thr Asn Asn Ser Ala Lys Thr Val Lys Lys Ile  
260 265 270

Arg Val Ser Val Arg Gln Tyr Ala Asp Ile Cys Leu Phe Ser Thr Ala  
275 280 285

Gln Tyr Lys Cys Pro Val Ala Gln Leu Glu Gln Asp Asp Gln Val Ser  
290 295 300

Pro Ser Ser Thr Phe Cys Lys Val Tyr Thr Ile Thr Pro Leu Leu Thr  
Page 13

305

310

315

320

Asp Asn Arg Glu Lys Arg Gly Leu Ala Leu His Gly Gln Leu Asn His  
325 330 335

Glu His Thr Asn Leu Ala Ser Ser Thr Ile Val Lys Glu Gly Ala Asn  
340 345 350

Glu Val Leu Gly Ile Leu Val Ser Tyr Arg Val Lys Val Lys Leu Val  
355 360 365

Val Ser Pro Gly Gly Asp Leu Ser Val Glu Leu Pro Phe Val Leu Met  
370 375 380

His Pro Lys Pro His His Ile Thr Leu Pro Pro Pro Gln Ser Ala  
385 390 395 400

Pro Arg Glu Ile Asp Ile Pro Val Asp Thr Asn Leu Ile Glu Phe Asp  
405 410 415

Thr Asn Tyr Ala Thr Asp Asp Asp Ile Val Phe Glu Asp Phe Ala Arg  
420 425 430

Leu Arg Leu Lys Gly Met Lys Asp Asp Asp Cys Asp Asp Gln Phe Cys  
435 440 445

Val Asp Gln Ile Phe Val Lys Thr Leu Thr Gly Lys Thr Ile Thr Leu  
450 455 460

Glu Val Glu Pro Ser Asp Thr Ile Glu Asn Val Lys Ala Lys Ile Gln  
465 470 475 480

Asp Lys Glu Gly Ile Pro Pro Asp Gln Gln Arg Leu Ile Phe Ala Gly  
485 490 495

Arg Gln Leu Glu Asp Gly Arg Thr Leu Ser Asp Tyr Asn Ile Gln Lys  
500 505 510

Glu Ser Thr Leu His Leu Val Leu Arg Leu Arg Gly Gly  
515 520 525

<210> 7

<211> 43

<212> PRT

<213> Homo sapiens

<400> 7

Asn Pro Ile Val Tyr Ala Phe Arg Ile Gly Lys Phe Arg Val Thr Phe  
1 5 10 15

Leu Lys Ile Trp Asn Asp His Phe Arg Cys Gln Pro Ala Pro Pro Ile  
20 25 30

Asp Glu Asp Ile Pro Glu Glu Arg Pro Asp Asp  
35 40

<210> 8  
<211> 177  
<212> PRT  
<213> Homo sapiens

<400> 8

Asn Pro Ile Ile Tyr Pro Glu Ser Ser Lys Glu Phe Lys Arg Ala Phe  
1 5 10 15

Val Arg Ile Leu Gly Glu Gly Cys Arg Gly Arg Arg Arg Arg Arg  
20 25 30

Arg Arg Arg Arg Arg Leu Gly Gly Cys Ala Tyr Thr Tyr Arg Pro Trp  
35 40 45

Thr Arg Gly Gly Ser Leu Glu Arg Ser Gly Ser Arg Lys Asp Ser Leu  
50 55 60

Asp Asp Ser Gly Ser Cys Leu Ser Gly Ser Gln Leu Thr Leu Pro Ser  
65 70 75 80

Ala Ser Pro Ser Pro Gly Tyr Leu Gly Arg Gly Ala Pro Pro Pro Val  
85 90 95

Glu Leu Cys Ala Phe Pro Glu Trp Lys Ala Pro Gly Ala Leu Leu Ser  
100 105 110

Ile Pro Ala Pro Glu Pro Pro Gly Arg Arg Gly Arg His Asp Ser Gly  
115 120 125

Pro Leu Phe Thr Phe Lys Leu Leu Thr Glu Pro Glu Ser Pro Gly Thr  
130 135 140

Asp Gly Gly Ala Ser Asn Gly Gly Cys Glu Ala Ala Ala Asp Val Ala  
145 150 155 160

Asn Gly Gly Pro Gly Phe Lys Ser Met Asn Pro Leu Ala Pro Gly Gln  
165 170 175

Phe

<210> 9  
<211> 30  
<212> PRT  
<213> Homo sapiens

<400> 9

Asn Pro Val Ile Tyr Thr Ile Phe Asn His Asp Phe Arg Arg Ala Phe  
1 5 10 15

Lys Lys Ile Leu Cys Arg Gly Asp Arg Leu Cys Arg Ile Val  
20 25 30

<210> 10  
<211> 29  
<212> PRT  
<213> Homo sapiens

<400> 10

Asn Pro Val Ile Tyr Thr Ile Phe Asn Gln Asp Phe Arg Arg Ala Phe  
1 5 10 15

Arg Arg Ile Leu Cys Arg Pro Trp Thr Gln Thr Ala Trp  
20 25

<210> 11  
<211> 30  
<212> PRT  
<213> Homo sapiens

<400> 11

Asn Pro Val Ile Tyr Thr Val Phe Asn Gln Asp Phe Arg Pro Ser Phe  
1 5 10 15

Lys His Ile Leu Phe Arg Arg Arg Arg Gly Phe Arg Gln  
20 25 30

<210> 12  
<211> 105  
<212> PRT  
<213> Homo sapiens

<400> 12

Asn Pro Ile Ile Tyr Cys Arg Ser Pro Asp Phe Arg Lys Ala Phe Gln  
1 5 10 15

Gly Leu Leu Cys Cys Ala Arg Arg Ala Ala Arg Arg Arg His Ala Thr  
20 25 30

His Gly Asp Arg Pro Arg Ala Ser Gly Cys Leu Ala Arg Pro Gly Pro  
35 40 45

Pro Pro Ser Pro Gly Ala Ala Ser Asp Asp Asp Asp Asp Asp Val Val  
50 55 60

Gly Ala Thr Pro Pro Ala Arg Leu Leu Glu Pro Trp Ala Gly Cys Asn  
65 70 75 80

Gly Gly Ala Ala Ala Asp Ser Asp Ser Ser Leu Asp Glu Pro Cys Arg  
85 90 95

Pro Gly Phe Ala Ser Glu Ser Lys Val  
100 105

<210> 13  
<211> 92  
<212> PRT  
<213> Homo sapiens

<400> 13

Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe Arg Ile Ala Phe Gln  
1 5 10 15

Glu Leu Leu Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn Gly  
20 25 30

Tyr Ser Ser Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val Glu  
35 40 45

Gly Glu Lys Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr Glu  
50 55 60

Asp Phe Val Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp Ser  
65 70 75 80

Gln Gly Arg Asn Cys Ser Thr Asn Asp Ser Leu Leu  
85 90

<210> 14  
<211> 120  
<212> PRT  
<213> Homo sapiens

<400> 14

Asn Pro Ile Ile Tyr Ala Phe Asn Ala Asp Phe Arg Lys Ala Phe Ser  
1 5 10 15

Thr Leu Leu Gly Cys Tyr Arg Leu Cys Pro Ala Thr Asn Asn Ala Ile  
20 25 30

Glu Thr Val Ser Ile Asn Asn Asn Gly Ala Ala Met Phe Ser Ser His  
Page 17

35

40

45

His Glu Pro Arg Gly Ser Ile Ser Lys Glu Cys Asn Leu Val Tyr Leu  
50 55 60

Ile Pro His Ala Val Gly Ser Ser Glu Asp Leu Lys Lys Glu Glu Ala  
65 70 75 80

Ala Gly Ile Ala Arg Pro Leu Glu Lys Leu Ser Pro Ala Leu Ser Val  
85 90 95

Ile Leu Asp Tyr Asp Thr Asp Val Ser Leu Glu Lys Ile Gln Pro Ile  
100 105 110

Thr Gln Asn Gly Gln His Pro Thr  
115 120

<210> 15

<211> 22

<212> PRT

<213> Homo sapiens

<400> 15

Asn Pro Ile Ile Tyr Thr Thr Phe Asn Ile Glu Phe Arg Lys Ala Phe  
1 5 10 15

Leu Lys Ile Leu His Cys  
20

<210> 16

<211> 22

<212> PRT

<213> Homo sapiens

<400> 16

Asn Pro Val Ile Tyr Thr Thr Phe Asn Ile Glu Phe Arg Lys Ala Phe  
1 5 10 15

Leu Lys Ile Leu Ser Cys  
20

<210> 17

<211> 24

<212> PRT

<213> Homo sapiens

<400> 17

Asn Pro Val Ile Tyr Thr Val Phe His Ala Glu Phe Arg Asn Val Phe  
1 5 10 15

Arg Lys Ala Leu Arg Ala Cys Cys  
20

<210> 18  
<211> 123  
<212> PRT  
<213> Homo sapiens

<400> 18

Asn Pro Val Ile Tyr Ala Phe Asn Ala Asp Phe Gln Lys Val Phe Ala  
1 5 10 15

Gln Leu Leu Gly Cys Ser His Phe Cys Ser Arg Thr Pro Val Glu Thr  
20 25 30

Val Asn Ile Ser Asn Glu Leu Ile Ser Tyr Asn Gln Asp Ile Val Phe  
35 40 45

His Lys Glu Ile Ala Ala Tyr Ile His Met Met Pro Asn Ala Val  
50 55 60

Thr Pro Gly Asn Arg Glu Val Asp Asn Asp Glu Glu Glu Gly Pro Phe  
65 70 75 80

Asp Arg Met Phe Gln Ile Tyr Gln Thr Ser Pro Asp Gly Asp Pro Val  
85 90 95

Ala Glu Ser Val Trp Glu Leu Asp Cys Glu Gly Glu Ile Ser Leu Asp  
100 105 110

Lys Ile Thr Pro Phe Thr Pro Asn Gly Phe His  
115 120

<210> 19  
<211> 47  
<212> PRT  
<213> Homo sapiens

<400> 19

Asn Pro Met Cys Tyr Ala Leu Cys Asn Lys Ala Phe Arg Asp Thr Phe  
1 5 10 15

Arg Leu Leu Leu Leu Cys Arg Trp Asp Lys Arg Arg Trp Arg Lys Ile  
20 25 30

Pro Lys Arg Pro Gly Ser Val His Arg Thr Pro Ser Arg Gln Cys  
35 40 45

<210> 20  
<211> 31

<212> PRT  
<213> Homo sapiens

<400> 20

Asn Pro Ala Cys Tyr Ala Leu Cys Asn Ala Thr Phe Lys Lys Thr Phe  
1 5 10 15

Lys His Leu His Met Cys His Tyr Lys Asn Ile Gly Ala Thr Arg  
20 25 30

<210> 21  
<211> 50  
<212> PRT  
<213> Homo sapiens

<400> 21

Asn Pro Val Cys Tyr Ala Leu Cys Asn Lys Thr Phe Arg Thr Thr Phe  
1 5 10 15

Met Leu Leu Leu Cys Gln Cys Asp Lys Lys Lys Arg Arg Lys Gln Gln  
20 25 30

Tyr Gln Gln Arg Gln Ser Val Ile Phe His Lys Arg Ala Pro Glu Gln  
35 40 45

Ala Leu  
50

<210> 22  
<211> 31  
<212> PRT  
<213> Homo sapiens

<400> 22

Asn Pro Ala Cys Tyr Ala Leu Cys Asn Ala Thr Phe Lys Lys Thr Phe  
1 5 10 15

Arg His Leu Leu Leu Cys Gln Tyr Arg Asn Ile Gly Thr Ala Arg  
20 25 30

<210> 23  
<211> 42  
<212> PRT  
<213> Homo sapiens

<400> 23

Asn Pro Ile Cys Tyr Ala Leu Cys Asn Arg Thr Phe Arg Lys Thr Phe  
1 5 10 15

Lys Met Leu Leu Leu Cys Arg Trp Lys Lys Lys Lys Val Glu Glu Lys  
20 25 30

Leu Tyr Trp Gln Gly Asn Ser Lys Leu Pro  
35 40

<210> 24  
<211> 24  
<212> PRT  
<213> Homo sapiens

<400> 24

Asn Pro Val Ile Tyr Ala Tyr Phe Asn Lys Asp Phe Gln Asn Ala Phe  
1 5 10 15

Lys Lys Ile Ile Lys Cys Lys Phe  
20

<210> 25  
<211> 26  
<212> PRT  
<213> Homo sapiens

<400> 25

Asn Pro Ile Ile Tyr Thr Met Ser Asn Glu Asp Phe Lys Gln Ala Phe  
1 5 10 15

His Lys Leu Ile Arg Phe Lys Cys Thr Ser  
20 25

<210> 26  
<211> 24  
<212> PRT  
<213> Homo sapiens

<400> 26

Asn Pro Leu Leu Tyr Thr Ser Phe Asn Glu Asp Phe Lys Leu Ala Phe  
1 5 10 15

Lys Lys Leu Ile Arg Cys Arg Glu  
20

<210> 27  
<211> 37  
<212> PRT  
<213> Homo sapiens

<400> 27

Asn Pro Ile Ile Tyr Cys Leu Arg Asn Gln Glu Val Lys Arg Ala Leu  
1 5 10 15

Cys Cys Ile Leu His Leu Tyr Gln His Gln Asp Pro Asp Pro Lys Lys  
20 25 30

Gly Ser Arg Asn Val  
35

<210> 28  
<211> 27  
<212> PRT  
<213> Homo sapiens

<400> 28

Asn Pro Leu Ile Tyr Thr Leu Arg Asn Met Glu Val Lys Gly Ala Leu  
1 5 10 15

Arg Arg Leu Leu Gly Lys Gly Arg Glu Val Gly  
20 25

<210> 29  
<211> 62  
<212> PRT  
<213> Homo sapiens

<400> 29

Asn Pro Leu Phe Tyr Gly Phe Leu Gly Lys Lys Phe Lys Arg Tyr Phe  
1 5 10 15

Leu Gln Leu Leu Lys Tyr Ile Pro Pro Lys Ala Lys Ser His Ser Asn  
20 25 30

Leu Ser Thr Lys Met Ser Thr Leu Ser Tyr Arg Pro Ser Asp Asn Val  
35 40 45

Ser Ser Ser Thr Lys Lys Pro Ala Pro Cys Phe Glu Val Glu  
50 55 60

<210> 30  
<211> 50  
<212> PRT  
<213> Homo sapiens

<400> 30

Asn Pro Phe Leu Tyr Cys Phe Val Gly Asn Arg Phe Gln Gln Lys Leu  
1 5 10 15

Arg Ser Val Phe Arg Val Pro Ile Thr Trp Leu Gln Gly Lys Arg Glu  
20 25 30

Ser Met Ser Cys Arg Lys Ser Ser Ser Leu Arg Glu Met Glu Thr Phe  
35 40 45

Val Ser

<210> 31  
 <211> 51  
 <212> PRT  
 <213> Homo sapiens

<400> 31

Asn Pro Leu Ile Tyr Ala Phe Ile Gly Gln Lys Phe Arg His Gly Leu  
 1 5 10 15

Leu Lys Ile Leu Ala Ile His Gly Leu Ile Ser Lys Asp Ser Leu Pro  
 20 25 30

Lys Asp Ser Arg Pro Ser Phe Val Gly Ser Ser Ser Gly His Thr Ser  
 35 40 45

Thr Thr Leu  
 50

<210> 32  
 <211> 67  
 <212> PRT  
 <213> Homo sapiens

<400> 32

Asn Pro Leu Ile Tyr Ala Phe Ala Gly Glu Lys Phe Arg Arg Tyr Leu  
 1 5 10 15

Tyr His Leu Tyr Gly Lys Cys Leu Ala Val Leu Cys Gly Arg Ser Val  
 20 25 30

His Val Asp Phe Ser Ser Ser Glu Ser Gln Arg Ser Arg His Gly Ser  
 35 40 45

Val Leu Ser Ser Asn Phe Thr Tyr His Thr Ser Asp Gly Asp Ala Leu  
 50 55 60

Leu Leu Leu  
 65

<210> 33  
 <211> 59  
 <212> PRT  
 <213> Homo sapiens

<400> 33

Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg His Ile Phe  
 1 5 10 15

Leu Ala Thr Leu Ala Cys Leu Cys Pro Val Trp Arg Arg Arg Arg Lys  
20 25 30

Arg Pro Ala Phe Ser Arg Lys Ala Asp Ser Val Ser Ser Asn His Thr  
35 40 45

Leu Ser Ser Asn Ala Thr Arg Glu Thr Leu Tyr  
50 55

<210> 34  
<211> 107  
<212> PRT  
<213> Homo sapiens

<400> 34

Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe  
1 5 10 15

Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu  
20 25 30

Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Gln Gly Ser Val  
35 40 45

Tyr Lys Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala  
50 55 60

His Glu Glu Glu Pro Glu Asp Gly Pro Lys Ala Thr Pro Ser Ser Leu  
65 70 75 80

Asp Leu Thr Ser Asn Cys Ser Ser Arg Ser Asp Ser Lys Thr Met Thr  
85 90 95

Glu Ser Phe Ser Phe Ser Ser Asn Val Leu Ser  
100 105

<210> 35  
<211> 51  
<212> PRT  
<213> Homo sapiens

<400> 35

Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Ser Val Ser Ser Glu Leu  
1 5 10 15

Arg Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly  
20 25 30

Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp  
35 40 45

Thr Ser Ser  
50

<210> 36  
<211> 83  
<212> PRT  
<213> Homo sapiens

<400> 36

Asn Pro Val Ile Tyr Asn Leu Met Ser Gln Lys Phe Arg Ala Ala Phe  
1 5 10 15

Arg Lys Leu Cys Asn Cys Lys Gln Lys Pro Thr Glu Lys Pro Ala Asn  
20 25 30

Tyr Ser Val Ala Leu Asn Tyr Ser Val Ile Lys Glu Ser Asp His Phe  
35 40 45

Ser Thr Glu Leu Asp Asp Ile Thr Val Thr Asp Thr Tyr Leu Ser Ala  
50 55 60

Thr Lys Val Ser Phe Asp Asp Thr Cys Leu Ala Ser Glu Val Ser Phe  
65 70 75 80

Ser Gln Ser

<210> 37  
<211> 65  
<212> PRT  
<213> Homo sapiens

<400> 37

Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Glu Leu  
1 5 10 15

Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Arg  
20 25 30

Leu Gly Glu Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val  
35 40 45

Leu Ser His Arg Ser Ser Ser Gly Arg Ser Cys Ser Gln Pro Ser Thr  
50 55 60

Ala  
65

<210> 38  
<211> 74  
<212> PRT  
<213> Homo sapiens

<400> 38

Asn Pro Val Leu Tyr Ser Leu Met Ser Ser Arg Phe Glu Thr Phe Gln  
1 5 10 15

Glu Ala Leu Cys Leu Gly Ala Cys Cys His Arg Leu Arg Pro Arg His  
20 25 30

Ser Ser His Ser Leu Ser Arg Met Thr Thr Gly Ser Thr Leu Cys Asp  
35 40 45

Val Gly Ser Leu Gly Ser Trp Val His Pro Leu Ala Gly Asn Asp Gly  
50 55 60

Pro Glu Ala Gln Gln Glu Thr Asp Pro Ser  
65 70

<210> 39  
<211> 62  
<212> PRT  
<213> Homo sapiens

<400> 39

Asn Pro Leu Val Tyr Cys Phe Met His Arg Arg Phe Arg Arg Gln Ala Cys  
1 5 10 15

Leu Glu Thr Cys Ala Arg Cys Cys Pro Arg Pro Pro Arg Ala Arg Pro  
20 25 30

Arg Ala Leu Pro Asp Glu Asp Pro Pro Thr Pro Ser Ile Ala Ser Leu  
35 40 45

Ser Arg Leu Ser Tyr Thr Ile Ser Thr Leu Gly Pro Gly  
50 55 60

<210> 40  
<211> 82  
<212> PRT  
<213> Homo sapiens

<400> 40

Asn Pro Leu Val Tyr Ala Leu Ala Ser Arg His Phe Arg Ala Arg Phe  
1 5 10 15

Arg Arg Leu Trp Pro Cys Gly Arg Arg Arg Arg His Arg Ala Arg Arg  
20 25 30

Ala Leu Arg Arg Val Arg Pro Ala Ser Ser Gly Pro Pro Gly Cys Pro  
35 40 45

Gly Asp Ala Arg Pro Ser Gly Arg Leu Leu Ala Gly Gly Gly Gln Gly  
50 55 60

Pro Glu Pro Arg Glu Gly Pro Val His Gly Gly Glu Ala Ala Arg Gly  
65 70 75 80

Pro Glu

<210> 41  
<211> 76  
<212> PRT  
<213> Homo sapiens

<400> 41

Asn Pro Ile Ile Tyr Thr Leu Thr Asn Lys Glu Met Arg Arg Ala Phe  
1 5 10 15

Ile Arg Ile Met Ser Cys Cys Lys Cys Pro Ser Gly Asp Ser Ala Gly  
20 25 30

Lys Phe Lys Arg Pro Ile Ile Ala Gly Met Glu Phe Ser Arg Ser Lys  
35 40 45

Ser Asp Asn Ser Ser His Pro Gln Lys Asp Glu Gly Asp Asn Pro Glu  
50 55 60

Thr Ile Met Ser Ser Gly Asn Val Asn Ser Ser Ser  
65 70 75

<210> 42  
<211> 80  
<212> PRT  
<213> Homo sapiens

<400> 42

Asn Pro Ile Ile Tyr Ala Leu Arg Ser Lys Asp Leu Arg His Ala Phe  
1 5 10 15

Arg Ser Met Phe Pro Ser Cys Glu Gly Thr Ala Gln Pro Leu Asp Asn  
20 25 30

Ser Met Gly Asp Ser Asp Cys Leu His Lys His Ala Asn Asn Ala Ala  
35 40 45

Ser Val His Arg Ala Ala Glu Ser Cys Ile Lys Ser Thr Val Lys Ile  
Page 27

50

55

60

Ala Lys Val Thr Met Ser Val Ser Thr Asp Thr Ser Ala Glu Ala Leu  
65 70 75 80

<210> 43

<211> 59

<212> PRT

<213> Homo sapiens

<400> 43

Asn Pro Val Leu Tyr Ala Phe Leu Asp Glu Asn Phe Lys Arg Cys Phe  
1 5 10 15

Arg Gly Leu Cys Arg Lys Pro Cys Gly Arg Pro Asp Pro Ser Ser Phe  
20 25 30

Ser Arg Pro Arg Glu Ala Thr Ala Arg Glu Arg Val Thr Ala Cys Thr  
35 40 45

Pro Ser Asp Gly Pro Gly Gly Arg Ala Ala  
50 55

<210> 44

<211> 58

<212> PRT

<213> Homo sapiens

<400> 44

Asp Pro Phe Val Tyr Tyr Phe Val Ser His Asp Phe Arg Asp His Ala  
1 5 10 15

Lys Asn Ala Leu Leu Cys Arg Ser Val Arg Thr Val Lys Gln Met Gln  
20 25 30

Val Ser Leu Thr Ser Lys Lys His Ser Arg Lys Ser Ser Ser Tyr Ser  
35 40 45

Ser Ser Ser Thr Thr Val Lys Thr Ser Tyr  
50 55

<210> 45

<211> 66

<212> PRT

<213> Rattus norvegicus

<400> 45

Asn Gly Glu Val Gln Ala Glu Leu Arg Arg Lys Trp Arg Arg Trp His  
1 5 10 15

Leu Gln Gly Val Leu Gly Trp Ser Ser Lys Ser Gln His Pro Trp Gly  
20 25 30

Gly Ser Asn Gly Ala Thr Cys Ser Thr Gln Val Ser Met Leu Thr Arg  
35 40 45

Val Ser Pro Ser Ala Arg Arg Ser Ser Ser Phe Gln Ala Glu Val Ser  
50 55 60

Leu Val  
65